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AUTHOR Rafky, David M.; Beckerman, Marvin
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ABSTRACT

What are the relative effects of self-interest and altruistic motives on teacher acceptance of educational innovation after the effects of the following classes of variables have been taken into account: personal attributes, characteristics of the school system, characteristics of the school, career patterns, and psychological predispositions? Using a method of partial and multiple correlation, it was found that the willingness of 240 elementary school teachers to devote time and effort to the implementation of 15 new programs is more strongly related to self-interest than to altruism. The findings do not fit the model of professionalization proposed by Flexner. In addition, it was found that Miller's inventory of change-proneness is unreliable and multidimensional and appears to lack content validity. (Author)

ED 079267

Teachers' Acceptance of Innovations: Self-Interest, Altruism, and Professionalization[1]

by

David M. Rafky[2]

Marvin Beckerman[3]

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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INTRODUCTION

Mort (1964) estimates that on the average, fifty years are required for an innovation to diffuse through the American school system. To be sure, certain characteristics of innovations facilitate or hinder their adoption: relative advantage, compatibility with users, complexity, divisibility (suitability for limited trails), communicability (Rogers, 1962; Carlson, 1965), cost, pre-assembly of materials, implementation supports (e. g., training sessions for users), congruence (compatibility with existing programs)

[1]The data were collected with the cooperation and support of the Central New York School Study Council at Syracuse University.

[2]Dr. Rafky is an Assistant Professor at the City College of Loyola University, New Orleans.

[3]Dr. Beckerman is a High School Principal in St. Louis, Mo.

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(Miles, 1964), and, availability of support materials [e.g., guides, bibliographies(Brickell, 1964)]. Studies in agriculture, medicine and education (Coleman, Katz & Menzel, 1957; Menzel, 1960; Marsh & Coleman, 1954; Kreitlow & Duncan, 1956) indicate that personal attributes, background, career, and organizational variables affect the acceptance of innovations. For example, Carlson (1965) found that the rate of adoption of educational innovations depends upon social status network involvement, population density, and the prestige of the change agent. High status opinion leaders are "sought out most frequently for advice by men of relatively high status . . . in relatively small geographic areas having a high density of subjects and where distance between advisees and advisors does not govern their advice-seeking contacts" (Carlson, 1965, pp. 42-43). Carlson (1965) also observed that in comparison to school superintendents who accept innovations, school superintendents who resist change tend to have less formal education, to be chosen less often by other superintendents as friends, to know fewer peers intimately, to participate in fewer professional meetings, to interact less often with other superintendents, and to rely more on face-to-face information sources.

This paper focuses on two additional correlates of

teacher acceptance of innovations: self-interest and altruistic motives. We assume that such variables as 1) personal attributes, 2) characteristics of the school system, 3) characteristics of the school, 4) career patterns and 5) psychological predispositions are the major determinants of teacher adoption of new ideas and techniques. We, therefore, address ourselves to the following question: what are the relative effects of self-interest and altruistic motives on teacher acceptance of innovations after the effects of the above five categories of variables have been taken into account? We hypothesize that the five classes of background, career and system variables account for the majority of the variance of measured willingness to adopt innovations, and that a remainder of the variance will be apportioned to self-interest and altruism.

The relevance of this study is two-fold. First, the findings are descriptive; they indicate the degree to which teachers favor particular innovations and the impacts of a series of independent variables on these attitudes. This is useful information for educational policy-makers, administrators, and personnel officers who seek to introduce change into the schools. For example, we found that teachers are particularly unlikely to support merit pay. This is baseline

data for school systems considering such a salary schedule. Schools should either avoid this program or carefully prepare teachers for its introduction. On the other hand, we found that graduates of teachers colleges favor merit pay more than other teachers. Educators who want such a plan to succeed should therefore hire teachers college graduates and establish in-service training programs for those who attended liberal arts colleges.

Secondly, the findings have theoretical import. They shed light on the state of teacher professionalization. Virtually all discussions of "teaching as a profession" refer to the criteria for distinguishing professions proposed by Abraham Flexner in 1915: intellectual, learned, practical, teachable, internal organization, and altruism. Becker (1962, p. 27) shows that "many of these criteria recur in various permutations in later definitions." Stinnett (1962) for example, in the Profession of Teaching, begins with Flexner's criteria and proceeds to add those of Lieberman (1956) (autonomy and personal responsibility) and Carr-Saunders (1928) (competence, formation of professional associations, improvement of abilities through exchange of knowledge, experience and techniques). While many of these distinguishing marks of professions have been considered at

great length, one finds that little attention has been paid to Flexner's sixth criterion: altruism. Stinnett (1962), Dreeben (1970) and even Waller (1932) in his classic text, The Sociology of Teaching, do not discuss this characteristic of professions as it applies to teachers.

In specifying "altruism as one of the distinguishing marks of a profession," Flexner used "morally evaluative criteria to create an objectively discriminable class of phenomena" (Becker, 1962, p. 31). Altruism implies that the professional 1) works in some way for the "good" of society, 2) works for the "good" of the client, and 3) has unselfish motives. In short, devotion to service and the client are one of the "trademarks" of the professional:

> The client, therefore, is supposed to be able to count on the professional whose services he retains to have his best interests at heart. He rests comfortable in the knowledge that this is one relationship in which the rule of the marketplace does not apply. He need not beware but can give his full trust and confidence to the professional who is handling his problems; the service given him will be competent and unselfish. This is conceived as necessary if the professional is to perform his work successfully. If the patient

> cannot trust the physician completely, he will withhold facts that might be vital to successful treatment; the lawyer cannot protect his client's interests without full knowledge of his client's affairs, and this might be withheld if the client could not trust him. If the client is to trust the professional completely he must feel that there are no other interests which will be put before his in the performance of the professional activity (Becker, 1962, p. 37).

Flexner (1915) believes that altruism, expressed as "professional spirit," is the most important characteristic of professions and overshadows all of the other criteria:

> What matters most is professional spirit. All activities may be prosecuted in the genuine professional spirit. In so far as accepted professions are prosecuted at a mercenary or selfish level, law and medicine are ethically no better than trades. In so far as trades are honestly carried on, they tend to rise toward the professional level . . . . The unselfish devotion of those who have chosen to give themselves to making the world a fitter place to live in can fill social work with the professional spirit and thus to some extent lift it above all the distinctions [criteria for distinguishing professions]

which I have been at such pains to make (Flexner, 1915, p. 590).

Since altruism is the most important and least investigated component of professionalism, we intend to examine its effects on teachers' willingness to adopt innovative programs. To the extent that teachers' acceptance of change--when other relevant factors are controlled--is due largely to altruistic motives, they tend to fit the professional model. If the effects of self-interest are greater than those of altruism, teachers do not fit the professional ideal. We intend, therefore, to elucidate an issue that has perennially occupied educational researchers and polemicists: are teachers professionals?

METHOD

Subjects

The ideal population consists of all public school elementary teachers in Onondaga County, New York. The actual population is made up of elementary teachers in eleven school districts who were granted permission by their superintendents to participate in the study. In February 1970, largely pre-coded questionnaires were mailed to 500 teachers randomly selected (probability sample) from the

actual population. Two-hundred and forty teachers completed the instrument, a response rate of 48 percent. Since the major thrust of this study is theoretical rather than normative or descriptive, the representativeness of the sample is not crucial.

Measures and Instruments

The dependent variable is teacher acceptance of educational innovations. Fifteen policies and programs that have been suggested for the operation of the schools were listed. Criteria for the selection of innovations are those used by Hillson and Hyman in their survey, Change and Innovation in Elementary and Secondary Organization:

> Recency was one criterion. But in addition we asked ourselves, 'What is the relative impact of this idea on the educational scene?' To collect only esoteric, speculative, or romantic notions that could not be translated into action by the reader would not have fulfilled our purpose, namely, to show what is and what can be accomplished in changing and innovating educational processes (Hillson & Hyman, 1971, p. vii).

Respondents were asked: "Suppose the change were introduced, how willing would you be to devote activities related to it in your school?" Response choices and weights (Likert-type): 1 = very willing, 2 = somewhat willing, 3 = neither willing nor unwilling, 4 = somewhat unwilling, 5 = very unwilling.

Altruistic motives are indicated by concern for students. For each of the 15 innovations the respondents were asked: "If this change were introduced, do you feel that it would be beneficial or harmful for the students in your school?" (1=very beneficial, 2=somewhat beneficial, 3=neither beneficial nor harmful, 4=somewhat harmful, 5=very harmful.)

Self-interest is indicated by concern for one's self. For each of the 15 innovations the respondents were asked: "If this change were introduced, do you feel that it would be helpful or detrimental for you in your teaching in your school?" (1=very helpful, 2=somewhat helpful, 3=neither helpful nor detrimental, 4=somewhat detrimental, 5=very detrimental.)

Psychological predisposition to change was measured by Miller's (1967) Inventory of Change-proneness, developed especially for teachers. The instrument is "based on the assumption that a personal commitment to mental flexibility, openmindedness, and curiosity is an essential precondition for effective change" (Miller, 1967, p. 381). The inventory is a Lickert-type scale of 12 items, each referring to change related behavior or attitudes which respondents exhibit with varying frequencies (1=never, 2=almost never, 3=infrequently, 4=sometimes, 5=frequently, 6=almost always, 7=always). Responses to the 12 items are summed for each respondent. A high total score signifies "change-proneness" while a low score indicates psychological resistance to change. In a personal communication, Miller states that the reliability for the instrument is satisfactory:

> We have just established a good reliability measure for this study [instrument] with a sampling of teachers and graduate students. This is only one check on it but the reliability comes out quite high. We have not worked at the validity aspect yet. The inventory has been used, however, by a number of people. The results have been verbally positive, but we need more data.

Personal Attributes. Age, Sex, Marital Status, Religion, Prestige of Father's Occupation (background SES), Region in Which the Respondent Spent the First 18 Years of His Life. *

Characteristics of the School System. Number of Students, Number of Teachers, Number of Schools, Type of School District. **

Characteristics of The School. Number of Teachers, Number of Students, Number of Students in Homeroom. ***

Career Patterns of Teachers. Salary, Undergraduate Major (education, subject matter), Highest Level of Education (bachelor's, bachelor's plus credits, masters or equivalent, masters plus credits, certificate of advanced study or equivalent, doctorate), Number of Graduate Credits in Education, National Education Association (NEA) Membership Status, American Federation of Teachers (AFT) Membership Status, Region in Which the Respondent's College Was Located (urban, suburban, rural), Type of College Attended (liberal arts, teacher's college), Number of Years Teaching, Number of Years in School District, Number of Years in Present School, Grade Taught, Subject Taught, and Tenure.****

Footnotes for Previous Page

* Responses numbered in ascending order toward: older age groups, femaleness, Jewishness, Upper Classness, Northern Origin.

** Responses numbered in ascending order toward large numbers of students, teachers, schools, supervisory school districts.

*** Responses numbered in ascending order toward large numbers of teachers, students and size of homeroom.

**** Responses numbered in ascending order toward: high salaries, subject matter training, high degrees, many graduate credits, membership in various organizations, urbanness of college location, graduation from teachers college, many years teaching, many years in school district, in present school, humanities, and tenuredness.

Manipulation of the Data

Teachers' acceptance of educational innovations is the dependent variable and is denoted by y. There are five categories of control variables: psychological, personal, background, organizational, and career. The control variables are designated c_i where i represents the particular variable. For example, c_1 is score on Miller's Inventory of Change-proneness, c_2 is type of college attended, c_3 is membership in the NEA, and so on. x_i represents the independent variables, where x_1 is self-interest and x_2 is altruism.

The statistical procedure involves the computation of a multiple-partial correlation coefficient. This statistic, although rarely used by sociologists and educators, is particularly suited to the problem at hand, since it deals with questions of multiple and partial correlation simultaneously (Blalock, 1960). Concern with the relative effects of self-interest (x_1) and altruism (x_2) on teacher acceptance of innovations (y) suggests the use of multiple correlation. First, the zero-order coefficient for self-interest (x_1) and y is computed: R_{yx_1}. The square of this ($R^2_{yx_1}$) is the variance of y which is predicted by x_1. Then the effects of the second independent variable, altruism (x_2), are introduced into the coefficient: $R_{y \cdot x_1 x_2}$. The square of this ($R^2_{y \cdot x_1 x_2}$) represents the proportion of the variance accounted for with the addition of x_2.

This procedure must be modified, however, since researchers have found that other variables, such as psychological change-proneness (c_1) and type of college attended (c_2) influence willingness to change. These variables, denoted c_i, however, are not theoretically relevant to the problem under investigation, and their introduction into the multiple coefficient might obscure the effects of self-interest (x_1) and altruism (x_2). A multiple-partial coefficient is computed, therefore, in which the effects of c_i are controlled in a partialling procedure; this focuses attention on the relative influence of x_1 and x_2 on the dependent variable. The multiple-partial coefficient for y and x_1 and x_2, where c_i is controlled, is $r_{y(x_1x_2)\cdot c_i}$. Therefore, $r^2_{y(x_1)\cdot c_i}$ is the proportion of variance of y predicted by x_1 when c_i is controlled, and $r^2_{y(x_1x_2)\cdot c_i}$ is the proportion of the variance accounted for with the addition of the second independent variable. See Figure 1 for the formula for the multiple-partial correlation coefficient (Blalock, 1960, p. 350).

* * * Figure 1 about here * * *

Finally, it is important to point out that we recognize the limitations of the use of the Pearson coefficient; that variables have 1) few extreme values, 2) are metric, and 3) are linear. The data in this study do not satisfy these conditions. Nie, Bent, and Hull (1968, p. XIII-3) point out, however, that "in actuality, there is not firm agreement among practicing researchers on the selection of correlation coefficients--particularly in the advisability of the use of Pearson correlations with ordinal data." In addition, recent experiments, alluded to by Farrell (1970) indicate that the Pearson coefficient may be more robust, or imune from deviations from linearity and non-skewness, than has previously been thought. In light of these comments, and because of ease of computation, the Pearson correlation coefficient was used to measure association.

RESULTS AND DISCUSSION

The data in the first four columns of Table 1 show the willingness of teachers to devote time and effort to 15 educational innovations. Respondents favor all the changes, especially the concept approach and individualized instruction. Teachers are less than very willing and more than somewhat willing to accept certain changes in school

organization (departmentalization) and the use of hardware (video systems and computers). More radical changes in the organization of teaching (merit pay and modular-scheduling) are the least likely to gain favor among teachers; however, the respondents will not actively resist such programs. Perhaps teachers feel that it is "unprofessional" to resist actively programs reputed to benefit students. But teachers who give the appearance of neutrality (neither willing nor unwilling to help) sabotage such innovations as merit pay and modular scheduling by withholding their cooperation which is necessary for successful implementation.

We begin the correlation analysis by computing the zero-order coefficients for Miller's scale of change-proneness and willingness to support each innovation (R_{yc_1}). Table 1 shows that the correlations are low and negative.

* * * Table 1 about here * * *

This casts doubt on the validity of Miller's instrument. In order to have construct validity, the test should correlate highly and positively with willingness to devote time and effort to a wide variety of new programs, i.e., with the dependent variable (y).

The positive relationship between these two measures may be masked by one or more of the control variables. For example, examine the coefficients in Table 1 that appear

under the headings, R_{yc_2} and R_{yc_3}. They show that NEA membership, c_2, and type of college attended, c_3, are positively related to the dependent variable. That is, teachers who are members of the NEA, as well as graduates of teachers colleges, tend to support all educational innovations (except departmentalization). In addition, c_2 and c_3 are negatively related to Miller's index (c_1): $R_{c_1c_2}$ is -.170 and $R_{c_1c_3}$ is -.157. That is, respondents who did not attend teachers colleges (graduates of liberal arts colleges) as well as those who are not NEA members, tend to be low on change-proneness. Thus, the negative relationship between change-proneness and support of innovations is spurious; c_2 and c_3 cause both variables to vary in such a manner that they appear to be negatively correlated. This is expressed diagrammatically in Figure 2.

* * * Figure 2 about here * * *

These findings may be explained in the following manner. People who attend teachers colleges learn about particular educational innovations and their benefits and so they support these new programs. On the other hand, graduates of liberal arts colleges did not take "methods" courses and were not exposed to new educational techniques. The liberal arts colleges, however, d oes produce (and attract) people who are generally flexible and open to new ideas,

i.e., who are high on change-proneness, whereas the more traditional and vocational teachers colleges do the reverse. Therefore, respondents who attended liberal arts colleges are generally open to new ideas but they are not aware of the importance of certain new techniques in education; consequently, they tend to score high on Miller's index of change-proneness and low on acceptance of specific educational innovations. For people who attended teachers colleges, the reverse is true. Similarly, NEA membership affects both the dependent variable and Miller's index. Membership in the NEA is an expression of interest and concern in education. The organization educates its members about new school programs and techniques. NEA members, therefore, tend to favor a number of educational changes. In addition, NEA members tend to be graduates of teachers colleges and to express a provincial attitude toward change and new ideas in fields other than education. This explains why they score low on Miller's index of change-proneness.

If this reasoning is correct, the positive association between Miller's index (c_1) and support for innovations (y) must appear when the effects of NEA membership (c_2) and type of college attended (c_3) are controlled in a partialling procedure. The findings confirm this interpretation; Table 1

shows that $r_{yc_1 \cdot c_2 c_3}$ is positive for the majority of the innovations.

The low positive adjusted correlations for Miller's index of change-proneness with each innovation suggests that the instrument has limited construct validity. We digress from our primary concern with self-interest and altruism to consider the issues involved in the measurement of predisposition to change and the claims Miller makes for his instrument.

Table 2 lists the 12 items in Miller's instrument in order of decreasing agreement. In the column at the right is the proportion of the respondents who always or almost always agree. Thus, the table shows that more than one-half of the respondents always or almost always 1) exercise

* * * Table 2 about here * * *

careful thought in selecting innovations, 2) are willing to try something new, 3) are open-minded, 4) risk failure, 5) have autonomy to initiate change, and 6) are willing to accept criticism. The means indicate that people tend to agree frequently (always or almost always) with each item. The test appears to be highly "fakable" and the social desirability of agreement is obvious. What teacher would admit to <u>never</u> being willing to try something new or <u>never</u> being open-minded? All the items are "positively" worded,

which facilitates a socially desirable response set.

Reliability was measured in terms of internal consistency and split-half association. The correlations of each item by total score ranged from .150 to .420. The correlation of scores over the first six items with the second six items was .398. Miller's instrument, therefore, does not meet acceptable standards for reliability. We then examined Miller's index for unidimensionality by constructing a Guttman scale of change-proneness. The percentages in the column at the right in Table 2 are the proportion of respondents giving the scale response--that is, the response indicating a favorable (always, almost always) attitude toward adoption of change. A favorable response is assigned a score of one; an unfavorable response (never, almost never, infrequently, sometimes, frequently) is scored zero. The coefficient of reproducibility is .29, indicating that the items do not form an acceptable Guttman scale. The coefficient of reproducibility was computed using all possible cutting points for favorable versus unfavorable responses. First, never was coded zero and all other responses one, then never and almost never were coded zero and the other alternatives one, and so on. In no instance did the coefficient of reproducibility exceed .29. Therefore, at least in the present sample, Miller's scale of change-proneness does not reliably measure a unidimensional attribute.

In fact, we found that the dependent variables (y) themselves make up a unidimensional test of willingness to adopt educational changes. The percentages in the fourth column of Table 1 represent the proportion of teachers giving the scale response--that is, the response indicating extreme willingness to adopt each particular innovation. A scale response is assigned a score of one; other responses are scored zero. Total scale scores thus range from zero, for the teacher who is not very willing to accept any educational changes, to 11 for teachers who are very willing to accept all 11 items included in the scale. The coefficient of reproducibility is .84, indicating that the items form an acceptable Guttman scale.

An important characteristic of Guttman scales is that a respondent's total score always has the same meaning since there is a relationship between the pattern of item responses and total score. That is, if we know an individual's total score, it is possible to predict, without examining his questionnaire, exactly which items he endorsed. This means that the list of programs in Table 1 may be thought of as an 11-item test of willingness to accept educational innovations in which the items are ranked in order of increasing difficulty. The typical respondent endorses all items in descending order

until a certain point of difficulty. After that point, he is unable to endorse any of the more "difficult" items. The probability is approximately 90 percent that a teacher who is very willing to accept any particular change will accept all those above it in the table. Thus teachers who are not very willing to accept the first innovation--the concept approach--are particularly unlikely to accept any of the others, and may be considered to rank low on the scale. Other cutting points were used to define the scale response, but the one used (very willing versus somewhat willing, neither willing nor unwilling, somewhat unwilling, very unwilling) resulted in the highest coefficient of reproducibility. Therefore, 11 of the items listed in Table 1 comprise a reliable and unidimensional test of willingness to accept change in education. Perhaps researchers will find such a test more useful than those (such as Miller's index) designed to measure processes which are <u>assumed</u> to underly adoption of change.

We now return to an examination of the effects of the independent and control variables on the dependent measure. Our initial assumption was that the control variables, c_i, are the <u>major</u> determinants of willingness to support specific educational changes (y). Table 1 shows that the control

variables do not account for a large proportion of the variance of the dependent variable: $R^2_{yc_i}$ ranges from .089 to .231 for each of the 15 suggested innovations. The control variables are highly correlated with one another and have only minor effects on adoption of new techniques and programs. Apparently, acceptance of innovations is not strongly related to background, career contingencies, psychological attributes or system and organizational variables. Other factors, such as self-interest and altruism may be the major components of change adoption.

In fact, the findings in the two columns at the right of Table 1 show this to be true. Self-interest and altruism are both important elements in educational change. Self-interest has the largest effect on willingness to devote time and effort to each of the 15 innovations. The contribution of self-interest to the dependent variable when c_i is controlled [$r^2_{y(x_1)\cdot c_i}$] is quite substantial, ranging from .337 for the concept approach to .532 for the use of paraprofessionals. Furthermore, the introduction of altruism (x_2) into the multiple-partial coefficient [$r^2_{y(x_1x_2)\cdot c_i}$] substantially improves the prediction. A comparison of the two colums at the right of Table 1 shows that the effects of self-interest (x_1) on the dependent measures are greater than

those attributable to altruism (x_2). Therefore, since self-interest is the primary component in teacher acceptance of change, we conclude that teachers do not meet the criterion of altruism in the professional model. While altruistic motivation is important in the adoption of change, it is not as important as self-interest.

CONCLUSION

This paper found that the willingness of 240 elementary school teachers to devote time and effort to the implementation of 15 new educational programs and policies is not strongly related to background, career, psychological, (school) district or organizational variables. Researchers in education, medicine and agriculture have focused on these "traditional" individual, aggregate, and organizational variables. While such studies have shown that some of these variables are better predictors of new program acceptance than others, it is important to keep in mind that measured correlations rarely exceed .350. Although coefficients of this magnitude are quite acceptable in the social sciences, they leave a large portion of the variance unexplained. Using a multiple-partial correlation procedure, we found that two additional factors, self-interest and altruistic motives, are the major determinants of acceptance of

innovations. For each of the 15 innovations, the effects of self-interest were greater than those of altruism, which indicates that teachers tend not to fit the model of professionalism proposed by Flexner (1915) and others. In addition, we found that Miller's (1967) inventory of change-proneness is unreliable, is not unidimensional, and does not appear to have construct validity. Educational researchers may find that the measure of the dependent variable, teachers' attitudes toward specific innovations, is a more useful, direct, reliable, and valid test of general change-proneness.

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FIGURE 1: The General Formula For The Multiple-Partial Correlation Coefficient

$$r^2_{i(jk\ldots N)\cdot tu\ldots w} = \frac{R^2_{i\cdot jk\ldots w} - R^2_{i\cdot tu\ldots w}}{1 - R^2_{i\cdot tu\ldots w}}$$

Figure 2.--the relationship between change-proneness (c_1), attitudes towards specific innovations (y), and two control variables, NEA membership (c_2) and type of college attended (c_3)

NEA membership

c_2 (1=no, 2=yes)

Type of college

c_3 (1= liberal arts, 2=teachers college)

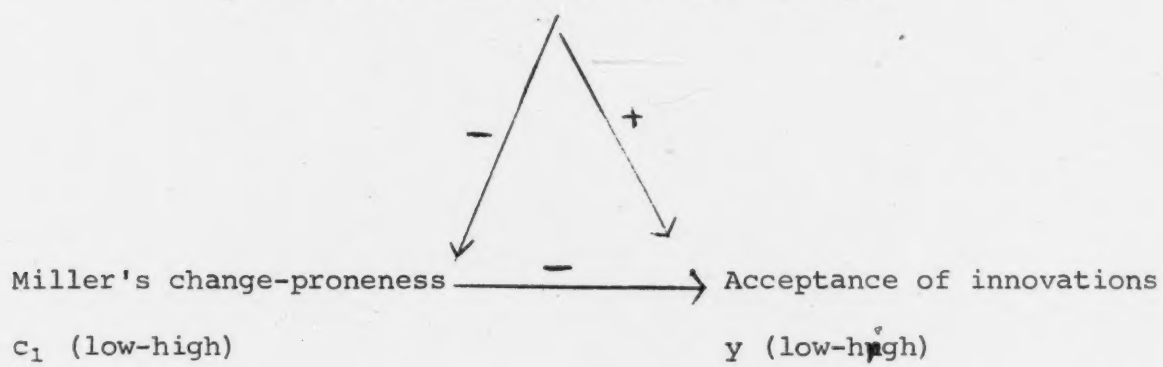

Table 1

Correlations of Willingness of 240 Elementary School Teachers to Devote Activities Related to 15 Educational Innovations By Several Independent and Control Variables

	Willingness to Support Innovations[b]						
Innovations[a]	N	SD	$\bar{X}$	% Very Willing	Included in Guttman Scale	R_{yc_1}	R_{yc_2}
Concept approach	231[c]	.63	1.36	69	yes	-.130	.161
Individualized instruction	230[c]	.82	1.50	63	yes	-.240	.203
Team teaching	232[c]	1.00	1.75	52	yes	-.237	.108
Non-grading	219[c]	1.03	1.82	48	NO	-.159	.148
Paraprofessionals	220[c]	.92	1.79	45	yes	-.113	.198
Pupil/team learning	228[c]	.81	1.72	45	no	-.176	.101
Guidance counselor	228[c]	.99	1.91	42	no	-.151	.100
Curriculum consultant	218[c]	.95	1.83	42	yes	-.198	.081
Independent study	219[c]	.95	1.89	40	yes	-.239	.104
Departmentalization	223[c]	1.21	2.30	31	yes	-.148	-.011
Master teacher	224[c]	1.09	2.25	26	yes	-.136	.102
Closed circuit video	224[c]	.99	2.16	25	NO	-.170	.059
Computer-assisted instruction	222[c]	.99	2.30	22	yes	-.201	.117
Merit-pay	230[c]	1.33	2.90	19	yes	-.082	.009
Modular scheduling	194[c]	1.05	2.50	15	yes	-.279	.051

Table 1--Continued

Innovations	R_{yc_3}	$r_{yc_1 \cdot c_2 c_3}$	$R^2_{yc_i}$	$r^2_{y(x_1) \cdot c_i}$	$r^2_{y(x_1 x_2) \cdot c_i}$
Concept approach	.081	.129	.201	.337	.509
Individualized instruction	.112	.183	.192	.470	.691
Team teaching	.103	.097	.221	.465	.697
Non-grading	-.021	.122	.177	.423	.616
Paraprofessionals	.104	.159	.106	.532	.809
Pupil/team learning	.101	.091	.201	.423	.662
Guidance counselor	.132	.126	.098	.514	.729
Curriculum consultant	.092	.072	.231	.493	.652
Independent study	.082	.098	.189	.427	.671
Departmentalization	.003	-.005	.151	.457	.703
Master teacher	.129	.120	.109	.516	.639
Closed circuit video	.109	.081	.136	.480	.601
Computer-assisted instruction	.169	.142	.291	.443	.590
Merit-pay	.102	.090	.197	.527	.601
Modlar scheduling	.103	.068	.111	.498	.669

[a]Innovations listed according to the descending magnitude of the percent "very willing."

[b]The question and response weights: Suppose this change were introduced, how willing would you be to devote activities related to it in your teaching: 1=Very willing, 2=Somewhat willing, 3=Neither willing nor unwilling, 4=Somewhat unwilling, 5=Very unwilling.

[c]Missing cases due to "blanks."

Table 2

Standard Deviations, Means and Guttman Scale of the Responses of 240 Teachers to the Miller Inventory of Change-Proneness

The Question	Response Choices and Weights			
Listed below are a number of questions relating to teachers' attitudes toward innovations in education. Please respond by circling the one number which best represents your feelings.	1=Never 2=Almost never 3=Infrequently 4=Sometimes 5=Frequently 6=Almost always 7=Always			
	No Response (in percent)	S.D.	$\bar{X}$	% Who Almost Always or Always Agree
Does your selection of innovations reflect careful thought about the overall needs and priorities of your situation?	0.8	0.93	5.94	73
Are you willing to try something new--something that will require extra initial effort on your part?	1.2	0.82	5.81	70
Is your general disposition toward new ideas and programs one of open-minded optimism?	0.4	0.95	5.57	60

Table 2--Continued

Items[a]	No Response (in percent)	S.D.	$\bar{X}$	% Who Almost Always or Always Agree
Are you willing to try something new even if it may fail? (Your answer should not apply to fragmented or poorly planned and structured ideas and programs.)- - - - - - - - - - -	0.0	1.09	5.46	55
Do you feel that you have sufficient freedom to initiate new programs and/or ideas?- - - - -	0.4	1.47	5.34	54
Are you willing to have your innovation brought under careful scrutiny by your colleagues and others with inherent possibilities of conflicting points of view--personal as well as professional?- - - - - - -	2.1	1.15	5.50	53
Are you aware (in terms of knowing some details) of the growing importance of research, experimentation, and innovation in American education?- - - - - - - - - - - - - -	1.2	1.02	5.37	43

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ABSTRACT

TEACHERS' ACCEPTANCE OF INNOVATIONS: SELF-INTEREST, ALTRUISM, AND PROFESSIONALIZATION

This paper is addressed to the following question: what are the relative effects of self-interest and altruistic motives on teacher acceptance of educational innovations after the effects of the following classes of variables have been taken into account: personal attributes, characteristics of the school system, characteristics of the school, career patterns, and psychological predispositions? It was found that the willingness of 240 elementary school teachers to devote time and effort to the implementation of 15 new programs is more strongly related to self-interest than to altruism, using a method of partial and multiple correlation. The findings do not fit the model of professionalization proposed by Flexner. In addition, it was found that Miller's inventory of change-proneness is unreliable, multidimensional, and appears to lack content validity.

Teachers' Acceptance of Innovations: Self-Interest, Altruism, and Professionalization[1]

by

David M. Rafky[2]

Marvin Beckerman[3]

INTRODUCTION

Mort (1964) estimates that on the average, fifty years are required for an innovation to diffuse through the American school system. To be sure, certain characteristics of innovations facilitate or hinder their adoption: relative advantage, compatibility with users, complexity, divisibility (suitability for limited trails), communicability (Rogers, 1962; Carlson, 1965), cost, pre-assembly of materials, implementation supports (e. g., training sessions for users), congruence (compatibility with existing programs)

[1]The data were collected with the cooperation and support of the Central New York School Study Council at Syracuse University.

[2]Dr. Rafky is an Assistant Professor at the City College of Loyola University, New Orleans.

[3]Dr. Beckerman is a High School Principal in St. Louis, Mo.

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(Miles, 1964), and, availability of support materials [e.g., guides, bibliographies[Brickell, 1964]. Studies in agriculture, medicine and education (Coleman, Katz & Menzel, 1957; Menzel, 1960; Marsh & Coleman, 1954; Kreitlow & Duncan, 1956) indicate that personal attributes, background, career, and organizational variables affect the acceptance of innovations. For example, Carlson (1965) found that the rate of adoption of educational innovations depends upon social status network involvement, population density, and the prestige of the change agent. High status opinion leaders are "sought out most frequently for advice by men of relatively high status . . . in relatively small geographic areas having a high density of subjects and where distance between advisees and advisors does not govern their advice-seeking contacts" (Carlson, 1965, pp. 42-43). Carlson (1965) also observed that in comparison to school superintendents who accept innovations, school superintendents who resist change tend to have less formal education, to be chosen less often by other superintendents as friends, to know fewer peers intimately, to participate in fewer professional meetings, to interact less often with other superintendents, and to rely more on face-to-face information sources.

This paper focuses on two additional correlates of

teacher acceptance of innovations: self-interest and altruistic motives. We assume that such variables as 1) personal attributes, 2) characteristics of the school system, 3) characteristics of the school, 4) career patterns and 5) psychological predispositions are the major determinants of teacher adoption of new ideas and techniques. We, therefore, address ourselves to the following question: what are the relative effects of self-interest and altruistic motives on teacher acceptance of innovations after the effects of the above five categories of variables have been taken into account? We hypothesize that the five classes of background, career and system variables account for the majority of the variance of measured willingness to adopt innovations, and that a remainder of the variance will be apportioned to self-interest and altruism.

The relevance of this study is two-fold. First, the findings are descriptive; they indicate the degree to which teachers favor particular innovations and the impacts of a series of independent variables on these attitudes. This is useful information for educational policy-makers, administrators, and personnel officers who seek to introduce change into the schools. For example, we found that teachers are particularly unlikely to support merit pay. This is baseline

data for school systems considering such a salary schedule. Schools should either avoid this program or carefully prepare teachers for its introduction. On the other hand, we found that graduates of teachers colleges favor merit pay more than other teachers. Educators who want such a plan to succeed should therefore hire teachers college graduates and establish in-service training programs for those who attended liberal arts colleges.

Secondly, the findings have theoretical import. They shed light on the state of teacher professionalization. Virtually all discussions of "teaching as a profession" refer to the criteria for distinguishing professions proposed by Abraham Flexner in 1915: intellectual, learned, practical, teachable, internal organization, and altruism. Becker (1962, p. 27) shows that "many of these criteria recur in various permutations in later definitions." Stinnett (1962) for example, in the Profession of Teaching, begins with Flexner's criteria and proceeds to add those of Lieberman (1956) (autonomy and personal responsibility) and Carr-Saunders (1928) (competence, formation of professional associations, improvement of abilities through exchange of knowledge, experience and techniques). While many of these distinguishing marks of professions have been considered at

great length, one finds that little attention has been paid to Flexner's sixth criterion: altruism. Stinnett (1962), Dreeben (1970) and even Waller (1932) in his classic text, The Sociology of Teaching, do not discuss this characteristic of professions as it applies to teachers.

In specifying "altruism as one of the distinguishing marks of a profession," Flexner used "morally evaluative criteria to create an objectively discriminable class of phenomena" (Becker, 1962, p. 31). Altruism implies that the professional 1) works in some way for the "good" of society, 2) works for the "good" of the client, and 3) has unselfish motives. In short, devotion to service and the client are one of the "trademarks" of the professional:

> The client, therefore, is supposed to be able to count on the professional whose services he retains to have his best interests at heart. He rests comfortable in the knowledge that this is one relationship in which the rule of the marketplace does not apply. He need not beware but can give his full trust and confidence to the professional who is handling his problems; the service given him will be competent and unselfish. This is conceived as necessary if the professional is to perform his work successfully. If the patient

> cannot trust the physician completely, he will withhold facts that might be vital to successful treatment; the lawyer cannot protect his client's interests without full knowledge of his client's affairs, and this might be withheld if the client could not trust him. If the client is to trust the professional completely he must feel that there are no other interests which will be put before his in the performance of the professional activity (Becker, 1962, p. 37).

Flexner (1915) believes that altruism, expressed as "professional spirit," is the most important characteristic of professions and overshadows all of the other criteria:

> What matters most is professional spirit. All activities may be prosecuted in the genuine professional spirit. In so far as accepted professions are prosecuted at a mercenary or selfish level, law and medicine are ethically no better than trades. In so far as trades are honestly carried on, they tend to rise toward the professional level . . . . The unselfish devotion of those who have chosen to give themselves to making the world a fitter place to live in can fill social work with the professional spirit and thus to some extent lift it above all the distinctions [criteria for distinguishing professions]

which I have been at such pains to make (Flexner, 1915, p. 590).

Since altruism is the most important and least investigated component of professionalism, we intend to examine its effects on teachers' willingness to adopt innovative programs. To the extent that teachers' acceptance of change--when other relevant factors are controlled--is due largely to altruistic motives, they tend to fit the professional model. If the effects of self-interest are greater than those of altruism, teachers do not fit the professional ideal. We intend, therefore, to elucidate an issue that has perennially occupied educational researchers and polemicists: are teachers professionals?

METHOD

Subjects

The ideal population consists of all public school elementary teachers in Onondaga County, New York. The actual population is made up of elementary teachers in eleven school districts who were granted permission by their superintendents to participate in the study. In February 1970, largely pre-coded questionnaires were mailed to 500 teachers randomly selected (probability sample) from the

actual population. Two-hundred and forty teachers completed the instrument, a response rate of 48 percent. Since the major thrust of this study is theoretical rather than normative or descriptive, the representativeness of the sample is not crucial.

Measures and Instruments

The dependent variable is teacher acceptance of educational innovations. Fifteen policies and programs that have been suggested for the operation of the schools were listed. Criteria for the selection of innovations are those used by Hillson and Hyman in their survey, Change and Innovation in Elementary and Secondary Organization:

> Recency was one criterion. But in addition we asked ourselves, 'What is the relative impact of this idea on the educational scene?' To collect only esoteric, speculative, or romantic notions that could not be translated into action by the reader would not have fulfilled our purpose, namely, to show what is and what can be accomplished in changing and innovating educational processes (Hillson & Hyman, 1971, p. vii).

Respondents were asked: "Suppose the change were introduced, how willing would you be to devote activities related to it in your school?" Response choices and weights (Likert-type): 1 = very willing, 2 = somewhat willing, 3 = neither willing nor unwilling, 4 = somewhat unwilling, 5 = very unwilling.

Altruistic motives are indicated by concern for students. For each of the 15 innovations the respondents were asked: "If this change were introduced, do you feel that it would be beneficial or harmful for the students in your school?" (1=very beneficial, 2=somewhat beneficial, 3=neither beneficial nor harmful, 4=somewhat harmful, 5=very harmful.)

Self-interest is indicated by concern for one's self. For each of the 15 innovations the respondents were asked: "If this change were introduced, do you feel that it would be helpful or detrimental for you in your teaching in your school?" (1=very helpful, 2=somewhat helpful, 3=neither helpful nor detrimental, 4=somewhat detrimental, 5=very detrimental.)

Psychological predisposition to change was measured by Miller's (1967) Inventory of Change-proneness, developed especially for teachers. The instrument is "based on the assumption that a personal commitment to mental flexibility, openmindedness, and curiosity is an essential precondition for effective change" (Miller, 1967, p. 381). The inventory is a Lickert-type scale of 12 items, each referring to change related behavior or attitudes which respondents exhibit with varying frequencies (1=never, 2=almost never, 3=infrequently, 4=sometimes, 5=frequently, 6=almost always, 7=always). Responses to the 12 items are summed for each respondent. A high total score signifies "change-proneness" while a low score indicates psychological resistance to change. In a personal communication, Miller states that the reliability for the instrument is satisfactory:

> We have just established a good reliability measure for this study [instrument] with a sampling of teachers and graduate students. This is only one check on it but the reliability comes out quite high. We have not worked at the validity aspect yet. The inventory has been used, however, by a number of people. The results have been verbally positive, but we need more data.

Personal Attributes. Age, Sex, Marital Status, Religion, Prestige of Father's Occupation (background SES), Region in Which the Respondent Spent the First 18 Years of His Life. *

Characteristics of the School System. Number of Students, Number of Teachers, Number of Schools, Type of School District. **

Characteristics of The School. Number of Teachers, Number of Students, Number of Students in Homeroom. ***

Career Patterns of Teachers. Salary, Undergraduate Major (education, subject matter), Highest Level of Education (bachelor's, bachelor's plus credits, masters or equivalent, masters plus credits, certificate of advanced study or equivalent, doctorate), Number of Graduate Credits in Education, National Education Association (NEA) Membership Status, American Federation of Teachers (AFT) Membership Status, Region in Which the Respondent's College Was Located (urban, suburban, rural), Type of College Attended (liberal arts, teacher's college), Number of Years Teaching, Number of Years in School District, Number of Years in Present School, Grade Taught, Subject Taught, and Tenure.****

Footnotes for Previous Page

* Responses numbered in ascending order toward: older age groups, femaleness, Jewishness, Upper Classness, Northern Origin.

** Responses numbered in ascending order toward large numbers of students, teachers, schools, supervisory school districts.

*** Responses numbered in ascending order toward large numbers of teachers, students and size of homeroom.

**** Responses numbered in ascending order toward: high salaries, subject matter training, high degrees, many graduate credits, membership in various organizations, urbanness of college location, graduation from teachers college, many years teaching, many years in school district, in present school, humanities, and tenuredness.

Manipulation

of the Data

Teachers' acceptance of educational innovations is the dependent variable and is denoted by y. There are five categories of control variables: psychological, personal, background, organizational, and career. The control variables are designated c_i where i represents the particular variable. For example, c_1 is score on Miller's Inventory of Change-proneness, c_2 is type of college attended, c_3 is membership in the NEA, and so on. x_i represents the independent variables, where x_1 is self-interest and x_2 is altruism.

The statistical procedure involves the computation of a multiple-partial correlation coefficient. This statistic, although rarely used by sociologists and educators, is particularly suited to the problem at hand, since it deals with questions of multiple and partial correlation simultaneously (Blalock, 1960). Concern with the relative effects of self-interest (x_1) and altruism (x_2) on teacher acceptance of innovations (y) suggests the use of multiple correlation. First, the zero-order coefficient for self-interest (x_1) and y is computed: R_{yx_1}. The square of this ($R^2_{yx_1}$) is the variance of y which is predicted by x_1. Then the effects of the second independent variable, altruism (x_2), are introduced into the coefficient: $R_{y \cdot x_1 x_2}$. The square of this ($R^2_{y \cdot x_1 x_2}$) represents the proportion of the variance accounted for with the addition of x_2.

This procedure must be modified, however, since researchers have found that other variables, such as psychological change-proneness (c_1) and type of college attended (c_2) influence willingness to change. These variables, denoted c_i, however, are not theoretically relevant to the problem under investigation, and their introduction into the multiple coefficient might obscure the effects of self-interest (x_1) and altruism (x_2). A multiple-partial coefficient is computed, therefore, in which the effects of c_i are controlled in a partialling procedure; this focuses attention on the relative influence of x_1 and x_2 on the dependent variable. The multiple-partial coefficient for y and x_1 and x_2, where c_i is controlled, is $r_{y(x_1x_2)\cdot c_i}$. Therefore, $r^2_{y(x_1)\cdot c_i}$ is the proportion of variance of y predicted by x_1 when c_i is controlled, and $r^2_{y(x_1x_2)\cdot c_i}$ is the proportion of the variance accounted for with the addition of the second independent variable. See Figure 1 for the formula for the multiple-partial correlation coefficient (Blalock, 1960, p. 350).

* * * Figure 1 about here * * *

Finally, it is important to point out that we recognize the limitations of the use of the Pearson coefficient; that variables have 1) few extreme values, 2) are metric, and 3) are linear. The data in this study do not satisfy these conditions. Nie, Bent, and Hull (1968, p. XIII-3) point out, however, that "in actuality, there is not firm agreement among practicing researchers on the selection of correlation coefficients--particularly in the advisability of the use of Pearson correlations with ordinal data." In addition, recent experiments, alluded to by Farrell (1970) indicate that the Pearson coefficient may be more robust, or imune from deviations from linearity and non-skewness, than has previously been thought. In light of these comments, and because of ease of computation, the Pearson correlation coefficient was used to measure association.

RESULTS AND DISCUSSION

The data in the first four columns of Table 1 show the willingness of teachers to devote time and effort to 15 educational innovations. Respondents favor all the changes, especially the concept approach and individualized instruction. Teachers are less than very willing and more than somewhat willing to accept certain changes in school

organization (departmentalization) and the use of hardware (video systems and computers). More radical changes in the organization of teaching (merit pay and modular-scheduling) are the least likely to gain favor among teachers; however, the respondents will not actively resist such programs. Perhaps teachers feel that it is "unprofessional" to resist actively programs reputed to benefit students. But teachers who give the appearance of neutrality (neither willing nor unwilling to help) sabotage such innovations as merit pay and modular scheduling by withholding their cooperation which is necessary for successful implementation.

We begin the correlation analysis by computing the zero-order coefficients for Miller's scale of change-proneness and willingness to support each innovation (R_{yc_1}). Table 1 shows that the correlations are low and negative.

* * * Table 1 about here * * *

This casts doubt on the validity of Miller's instrument. In order to have construct validity, the test should correlate highly and positively with willingness to devote time and effort to a wide variety of new programs, i.e., with the dependent variable (y).

The positive relationship between these two measures may be masked by one or more of the control variables. For example, examine the coefficients in Table 1 that appear

under the headings, R_{yc_2} and R_{yc_3}. They show that NEA membership, c_2, and type of college attended, c_3, are positively related to the dependent variable. That is, teachers who are members of the NEA, as well as graduates of teachers colleges, tend to support all educational innovations (except departmentalization). In addition, c_2 and c_3 are negatively related to Miller's index (c_1): $R_{c_1c_2}$ is -.170 and $R_{c_1c_3}$ is -.157. That is, respondents who did not attend teachers colleges (graduates of liberal arts colleges) as well as those who are <u>not</u> NEA members, tend to be low on change-proneness. Thus, the negative relationship between change-proneness and support of innovations is spurious; c_2 and c_3 cause both variables to vary in such a manner that they appear to be negatively correlated. This is expressed diagrammatically in Figure 2.

* * * Figure 2 about here * * *

These findings may be explained in the following manner. People who attend teachers colleges learn about particular educational innovations and their benefits and so they support these new programs. On the other hand, graduates of liberal arts colleges did not take "methods" courses and were not exposed to new educational techniques. The liberal arts colleges, however, does produce (and attract) people who are generally flexible and open to new ideas,

i.e., who are high on change-proneness, whereas the more traditional and vocational teachers colleges do the reverse. Therefore, respondents who attended liberal arts colleges are generally open to new ideas but they are not aware of the importance of certain new techniques in education; consequently, they tend to score high on Miller's index of change-proneness and low on acceptance of specific educational innovations. For people who attended teachers colleges, the reverse is true. Similarly, NEA membership affects both the dependent variable and Miller's index. Membership in the NEA is an expression of interest and concern in education. The organization educates its members about new school programs and techniques. NEA members, therefore, tend to favor a number of educational changes. In addition, NEA members tend to be graduates of teachers colleges and to express a provincial attitude toward change and new ideas in fields other than education. This explains why they score low on Miller's index of change-proneness.

If this reasoning is correct, the positive association between Miller's index (c_1) and support for innovations (y) must appear when the effects of NEA membership (c_2) and type of college attended (c_3) are controlled in a partialling procedure. The findings confirm this interpretation; Table 1

shows that $r_{yc_1 \cdot c_2 c_3}$ is positive for the majority of the innovations.

The low positive adjusted correlations for Miller's index of change-proneness with each innovation suggests that the instrument has limited construct validity. We digress from our primary concern with self-interest and altruism to consider the issues involved in the measurement of predisposition to change and the claims Miller makes for his instrument.

Table 2 lists the 12 items in Miller's instrument in order of decreasing agreement. In the column at the right is the proportion of the respondents who always or almost always agree. Thus, the table shows that more than one-half of the respondents always or almost always 1) exercise

* * * Table 2 about here * * *

careful thought in selecting innovations, 2) are willing to try something new, 3) are open-minded, 4) risk failure, 5) have autonomy to initiate change, and 6) are willing to accept criticism. The means indicate that people tend to agree frequently (always or almost always) with each item. The test appears to be highly "fakable" and the social desirability of agreement is obvious. What teacher would admit to <u>never</u> being willing to try something new or <u>never</u> being open-minded? All the items are "positively" worded,

which facilitates a socially desirable response set.

Reliability was measured in terms of internal consistency and split-half association. The correlations of each item by total score ranged from .150 to .420. The correlation of scores over the first six items with the second six items was .398. Miller's instrument, therefore, does not meet acceptable standards for reliability. We then examined Miller's index for unidimensionality by constructing a Guttman scale of change-proneness. The percentages in the column at the right in Table 2 are the proportion of respondents giving the scale response--that is, the response indicating a favorable (always, almost always) attitude toward adoption of change. A favorable response is assigned a score of one; an unfavorable response (never, almost never, infrequently, sometimes, frequently) is scored zero. The coefficient of reproducibility is .29, indicating that the items do not form an acceptable Guttman scale. The coefficient of reproducibility was computed using all possible cutting points for favorable versus unfavorable responses. First, never was coded zero and all other responses one, then never and almost never were coded zero and the other alternatives one, and so on. In no instance did the coefficient of reproducibility exceed .29. Therefore, at least in the present sample, Miller's scale of change-proneness does not reliably measure a unidimensional attribute.

In fact, we found that the dependent variables (y) themselves make up a unidimensional test of willingness to adopt educational changes. The percentages in the fourth column of Table 1 represent the proportion of teachers giving the scale response--that is, the response indicating extreme willingness to adopt each particular innovation. A scale response is assigned a score of one; other responses are scored zero. Total scale scores thus range from zero, for the teacher who is not very willing to accept any educational changes, to 11 for teachers who are very willing to accept all 11 items included in the scale. The coefficient of reproducibility is .84, indicating that the items form an acceptable Guttman scale.

An important characteristic of Guttman scales is that a respondent's total score always has the same meaning since there is a relationship between the pattern of item responses and total score. That is, if we know an individual's total score, it is possible to predict, without examining his questionnaire, exactly which items he endorsed. This means that the list of programs in Table 1 may be thought of as an 11-item test of willingness to accept educational innovations in which the items are ranked in order of increasing difficulty. The typical respondent endorses all items in descending order

until a certain point of difficulty. After that point, he is unable to endorse any of the more "difficult" items. The probability is approximately 90 percent that a teacher who is very willing to accept any particular change will accept all those above it in the table. Thus teachers who are not very willing to accept the first innovation--the concept approach--are particularly unlikely to accept any of the others, and may be considered to rank low on the scale. Other cutting points were used to define the scale response, but the one used (very willing versus somewhat willing, neither willing nor unwilling, somewhat unwilling, very unwilling) resulted in the highest coefficient of reproducibility. Therefore, 11 of the items listed in Table 1 comprise a reliable and unidimensional test of willingness to accept change in education. Perhaps researchers will find such a test more useful than those (such as Miller's index) designed to measure processes which are <u>assumed</u> to underly adoption of change.

We now return to an examination of the effects of the independent and control variables on the dependent measure. Our initial assumption was that the control variables, c_i, are the <u>major</u> determinants of willingness to support specific educational changes (y). Table 1 shows that the control

variables do not account for a large proportion of the variance of the dependent variable: $R^2_{yc_i}$ ranges from .089 to .231 for each of the 15 suggested innovations. The control variables are highly correlated with one another and together have only minor effects on adoption of new techniques and programs. Apparently, acceptance of innovations is neither strongly nor consistently related to background, career contingencies, psychological attributes or system and organizational variables. Other factors, such as self-interest and altruism may be the major components of change adoption.

In fact, the findings in the two columns at the right of Table 1 show this to be true. Self-interest and altruism are both important elements in educational change. Self-interest has the largest effect on willingness to devote time and effort to each of the 15 innovations. The contribution of self-interest to the dependent variable when c_i is controlled [$r^2_{y(x_1)\cdot c_i}$] is quite substantial, ranging from .337 for the concept approach to .532 for the use of paraprofessionals. Furthermore, the introduction of altruism (x_2) into the multiple-partial coefficient [$r^2_{y(x_1x_2)\cdot c_i}$] substantially improves the prediction. A comparison of the two colums at the right of Table 1 shows that the effects of self-interest (x_1) on the dependent measures are greater than

those attributable to altruism (x_2). Therefore, since self-interest is the primary component in teacher acceptance of change, we conclude that teachers do not meet the criterion of altruism in the professional model. While altruistic motivation is important in the adoption of change, it is not as important as self-interest.

CONCLUSION

This paper found that the willingness of 240 elementary school teachers to devote time and effort to the implementation of 15 new educational programs and policies is not strongly related to background, career, psychological, (school) district or organizational variables. Researchers in education, medicine and agriculture have focused on these "traditional" individual, aggregate, and organizational variables. While such studies have shown that some of these variables are better predictors of new program acceptance than others, it is important to keep in mind that measured correlations rarely exceed .350. Although coefficients of this magnitude are quite acceptable in the social sciences, they leave a large portion of the variance unexplained. Using a multiple-partial correlation procedure, we found that two additional factors, self-interest and altruistic motives, are the major determinants of acceptance of

innovations. For each of the 15 innovations, the effects of self-interest were greater than those of altruism, which indicates that teachers tend not to fit the model of professionalism proposed by Flexner (1915) and others. In addition, we found that Miller's (1967) inventory of change-proneness is unreliable, is not unidimensional, and does not appear to have construct validity. Educational researchers may find that the measure of the dependent variable, teachers' attitudes toward specific innovations, is a more useful, direct, reliable, and valid test of general change-proneness.

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FIGURE 1: The General Formula For The Multiple-Partial Correlation Coefficient

$$r^2_{i(jk\ldots N)\cdot tu\ldots w} = \frac{R^2_{i\cdot jk\ldots w} - R^2_{i\cdot tu\ldots w}}{1 - R^2_{i\cdot tu\ldots w}}$$

Figure 2.--the relationship between change-proneness (c_1), attitudes towards specific innovations (y), and two control variables, NEA membership (c_2) and type of college attended (c_3)

NEA membership

c_2 (1=no, 2=yes)

Type of college

c_3 (1= liberal arts, 2=teachers college)

Miller's change-proneness $\xrightarrow{\ -\ }$ Acceptance of innovations

c_1 (low-high) y (low-high)

Table 1

Correlations of Willingness of 240 Elementary School Teachers to Devote Activities Related to 15 Educational Innovations By Several Independent and Control Variables

	Willingness to Support Innovations[b]						
Innovations[a]	N	SD	$\bar{X}$	% VERY Willing	Included in Guttman Scale	R_{yc_1}	R_{yc_2}
Concept approach	231[c]	.63	1.36	69	yes	-.130	.161
Individualized instruction	230[c]	.82	1.50	63	yes	-.240	.203
Team teaching	232[c]	1.00	1.75	52	yes	-.237	.108
Non-grading	219[c]	1.03	1.82	48	NO	-.159	.148
Paraprofessionals	220[c]	.92	1.79	45	yes	-.113	.198
Pupil/team learning	228[c]	.81	1.72	45	no	-.176	.101
Guidance counselor	228[c]	.99	1.91	42	no	-.151	.100
Curriculum consultant	218[c]	.95	1.83	42	yes	-.198	.081
Independent study	219[c]	.95	1.89	40	yes	-.239	.104
Departmentalization	223[c]	1.21	2.30	31	yes	-.148	-.011
Master teacher	224[c]	1.09	2.25	26	yes	-.136	.102
Closed circuit video	224[c]	.99	2.16	25	NO	-.170	.059
Computer-assisted instruction	222[c]	.99	2.30	22	yes	-.201	.117
Merit-pay	230[c]	1.33	2.90	19	yes	-.082	.009
Modular scheduling	194[c]	1.05	2.50	15	yes	-.279	.051

Table 1--Continued

Innovations	R_{yc_3}	$r_{yc_1 \cdot c_2 c_3}$	$R^2_{yc_i}$	$r^2_{y(x_1) \cdot c_i}$	$r^2_{y(x_1 x_2) \cdot c_i}$
Concept approach	.081	.129	.201	.337	.509
Individualized instruction	.112	.183	.192	.470	.691
Team teaching	.103	.097	.221	.465	.697
Non-grading	-.021	.122	.177	.423	.616
Paraprofessionals	.104	.159	.106	.532	.809
Pupil/team learning	.101	.091	.201	.423	.662
Guidance counselor	.132	.126	.098	.514	.729
Curriculum consultant	.092	.072	.231	.493	.652
Independent study	.082	.098	.189	.427	.671
Departmentalization	.003	-.005	.151	.457	.703
Master teacher	.129	.120	.109	.516	.639
Closed circuit video	.109	.081	.136	.480	.601
Computer-assisted instruction	.169	.142	.291	.443	.590
Merit-pay	.102	.090	.197	.527	.601
Modlar scheduling	.103	.068	.111	.498	.669

[a]Innovations listed according to the descending magnitude of the percent "very willing."

[b]The question and response weights: Suppose this change were introduced, how willing would you be to devote activities related to it in your teaching: 1=Very willing, 2=Somewhat willing, 3=Neither willing nor unwilling, 4=Somewhat unwilling, 5=Very unwilling.

[c]Missing cases due to "blanks."

Table 2

Standard Deviations, Means and Guttman Scale of the Responses of 240 Teachers to the Miller Inventory of Change-Proneness

The Question	Response Choices and Weights			
Listed below are a number of questions relating to teachers' attitudes toward innovations in education. Please respond by circling the one number which best represents your feelings.	1=Never 2=Almost never 3=Infrequently 4=Sometimes 5=Frequently 6=Almost always 7=Always			
	No Response (in percent)	S.D.	$\bar{X}$	% Who Almost Always or Always Agree
Does your selection of innovations reflect careful thought about the overall needs and priorities of your situation?	0.8	0.93	5.94	73
Are you willing to try something new--something that will require extra initial effort on your part?	1.2	0.82	5.81	70
Is your general disposition toward new ideas and programs one of open-minded optimism?	0.4	0.95	5.57	60

Table 2--Continued

Items[a]	No Response (in percent)	S.D.	$\bar{X}$	% Who Almost Always or Always Agree
Are you willing to try something new even if it may fail? (Your answer should not apply to fragmented or poorly planned and structured ideas and programs.)	0.0	1.09	5.46	55
Do you feel that you have sufficient freedom to initiate new programs and/or ideas?	0.4	1.47	5.34	54
Are you willing to have your innovation brought under careful scrutiny by your colleagues and others with inherent possibilities of conflicting points of view--personal as well as professional?	2.1	1.15	5.50	53
Are you aware (in terms of knowing some details) of the growing importance of research, experimentation, and innovation in American education?	1.2	1.02	5.37	43

Table 2--Continued

Items[a]	No Response (in percent)	S.D.	$\bar{X}$	% Who Almost Always or Always Agree
When an educational innovations is considered, do you develop or help develop a strategy or plan of action for bringing about its successful implementation?	0.8	1.16	5.14	39
Do you make a special effort to read about innovations and changes in your field?	0.0	1.06	5.20	37
Do you exercise persistence and diplomacy in sticking with an innovation you would like to try, believing "powers that be" can be brought around from what may be an initial coolness?	1.7	1.26	4.89	36
Do you take time to consider and seek to gain greater insight into the process of educational change?	2.9	1.16	5.00	30
Do coffee hour or informal conversations include new ideas and developments in curriculum and instruction?	0.4	1.11	4.66	20

[a]Items are listed according to the decreasing magnitude of the scale response (% who almost always or always agree).